

REMARKS


This communication is in response to the Notice to File Corrected Application Papers mailed June 10, 2002. Applicants have replaced the Abstract as filed with a substitute Abstract which, in accordance with 37 C.F.R §1.72(b), does not exceed 150 words in length. No new matter has been added to the substitute Abstract. A marked-up copy of the Abstract as filed is enclosed herewith showing all changes relative thereto.

Should anything further be required, the Examiner is respectfully requested to telephone the undersigned at 702-558-1000 (x1071).

Respectfully submitted,

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## AMENDMENTS

### In the Abstract:

Please insert the following substitute Abstract for the Abstract as filed.

The present invention relates to novel electrode active materials represented by the general formula  $A_a M_b (XY_4)_c Z_d$ , wherein:

- (a) A is one or more alkali metals, and  $0 < a \leq 8$ ;
- (b) M is at least one metal capable of undergoing oxidation to a higher valence state, and  $1 \leq b \leq 3$ ;
- (c)  $XY_4$  is selected from the group consisting of  $X'O_{4-x}Y'_x$ ,  $X'O_{4-y}Y'_{2y}$ ,  $X''S_4$ , and a mixture thereof, where  $X'$  is P, As, Sb, Si, Ge, S, and mixtures thereof;  $X''$  is P, As, Sb, Si, Ge, and mixtures thereof,  $Y'$  is halogen,  $0 \leq x < 3$ ,  $0 < y < 4$ , and  $0 < c \leq 3$ ; and
- (d) Z is OH, a halogen, or mixtures thereof, and  $0 < d \leq 6$ .

## MARKED-UP VERSION OF ABSTRACT

[Electrode active materials comprising lithium or other alkali metals, a transition metal, a phosphate or similar moiety, and a halogen or hydroxyl moiety. The electrode actives include those of the formula:] The present invention relates to novel electrode active materials represented by the general formula  $A_aM_b(XY_4)_cZ_d$ , wherein:

- (a) A is [selected from the group consisting of Li, Na, K, and mixtures thereof] one or more alkali metals, and  $0 < a \leq [8]$  6;
- (b) M [comprises one or more metals, comprising] is at least one metal [which is] capable of undergoing oxidation to a higher valence state, and  $1 \leq b \leq 3$ ;
- (c)  $XY_4$  is selected from the group consisting of  $X'O_{4-x}Y'_x$ ,  $X'O_{4-y}Y'_{2y}$ ,  $X''S_4$ , [or] and a mixture thereof, where  $X'$  is P, As, Sb, Si, Ge, S, [or a mixture thereof] and mixtures thereof;  $X''$  is P, As, Sb, Si, Ge, [or a mixture thereof] and mixtures thereof.;  $Y'$  is halogen,  $0 \leq x < 3$ .;  $0 < y < 4$ .; and  $0 < c \leq 3$ ; and
- (d) Z is OH, a halogen, or mixtures thereof, and  $0 < d \leq 6$  .; and wherein M, X, Y, Z, a, b, c, d, x and y are selected so as to maintain electroneutrality of said compound.

In a preferred embodiment, M comprises two or more transition metals from Groups 4 to 11 of the Periodic Table. In another embodiment, M comprises  $M'_{1-m}M''_m$ , where  $M'$  is at least one transition metal from Groups 4 to 11 of the Periodic Table;  $M''$  is at least one element from Groups 2, 3, 12, 13 or 14 of the Periodic Table, and  $0 < m < 1$ . Preferred embodiments include those having where  $c = 1$ , those where  $c = 2$ , and those where  $c = 3$ . Preferred embodiments include those where  $a \leq 1$  and  $c = 1$ , those where  $a = 2$  and  $c = 1$ , and those where  $a \leq 3$  and  $c = 3$ . This invention also provides electrodes comprising an electrode active material of this

invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode having a compatible active material; and an electrolyte.]

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